

first and second optical monitors for measuring the backscattered Raman pump light from the span of transmission fiber at the first and second wavelengths, respectively; and

A3  
conc.).  
a control unit that uses the Raman pump to provide modulated Raman pump light to the span of transmission fiber and that uses the optical monitors to measure corresponding backscattered Raman pump light from the span of transmission fiber, wherein the control unit modulates the first wavelength to produce a series of pulses that are each 1-500 ns in duration and that have a frequency of less than 5 kHz.

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#### REMARKS

Claims 11, 12, and 15-17 were objected to as being dependent upon a rejected based claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. This has been done by incorporating the features of claim 11 into independent claim 1 and by rewriting claims 12 and 15-17 in independent form incorporating the features of claim 13 from which these claims depend.

Claims 3-11, 13, 14, and 18-23 have been cancelled.

The foregoing demonstrates that this application is in condition for allowance. Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,

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APPENDIX TO REPLY TO MAY 30, 2002 OFFICE ACTION

This appendix presents the claim amendments that have been made in bracket-and-underline format.

Claims 1, 12 and 15-17 have been amended as follows:

1. (Amended) Optical amplifier equipment that amplifies optical data signals in a fiber-optic communications link that has at least one span of transmission fiber for carrying the optical data signals, comprising:

a Raman pump that produces Raman pump light that creates Raman gain for the optical data signals in the span of transmission fiber;

[at least one optical monitor] a first optical monitor that measures a first wavelength of backscattered Raman pump light from the span of transmission fiber;

a second optical monitor that measures a second wavelength of the backscattered Raman pump light that is different than the first wavelength of backscattered Raman pump light; and

a control unit that uses the Raman pump and the optical monitors to perform optical time domain reflectometry measurements on the transmission fiber.

12. (Amended) [The optical amplifier equipment defined in claim 1 wherein the optical monitor comprises]  
Optical amplifier equipment that amplifies optical data signals in a fiber-optic communications link that has at least one span of transmission fiber for carrying the optical data signals, comprising:

a Raman pump that produces Raman pump light that creates Raman gain for the optical data signals in the span of transmission fiber;

a first optical monitor that measures a first wavelength of [the] backscattered Raman pump light [wherein the optical amplifier equipment further comprises] from the span of transmission fiber;

a second optical monitor that measures a second wavelength of the backscattered Raman pump light [and wherein the optical amplifier equipment further comprises];

a wavelength-division-multiplexing coupler that separates the backscattered Raman pump light by wavelength and

directs the separated backscattered Raman pump light to the first and second optical monitors, respectively; and

a control unit that uses the Raman pump and the optical monitors to perform optical time domain reflectometry measurements on the transmission fiber.

15. (Amended) [The optical amplifier equipment defined in claim 13] Optical amplifier equipment for amplifying optical data signals in a fiber-optic communications link that has at least one span of transmission fiber for carrying the optical data signals, comprising:

a Raman pump for producing Raman pump light to create Raman gain for the optical data signals in the span of transmission fiber, wherein the Raman pump light and the optical data signals propagate in opposite directions in the span of transmission fiber;

at least one optical monitor; and

a control unit that uses the Raman pump to provide modulated Raman pump light to the span of transmission fiber and that uses the optical monitor to measure corresponding backscattered Raman pump light from the span of transmission fiber, wherein the control unit is configured to

modulate the Raman pump light during use of the optical data signals to carry normal data traffic on the span of transmission fiber.

16. (Amended) [The optical amplifier equipment defined in claim 13] Optical amplifier equipment for amplifying optical data signals in a fiber-optic communications link that has at least one span of transmission fiber for carrying the optical data signals, comprising:

a Raman pump for producing Raman pump light to create Raman gain for the optical data signals in the span of transmission fiber, wherein the Raman pump light and the optical data signals propagate in opposite directions in the span of transmission fiber, and wherein the Raman pump produces pump light at a first wavelength and a second wavelength [and wherein the optical monitor comprises];

first and second optical monitors for measuring the backscattered Raman pump light from the span of transmission fiber at the first and second wavelengths, respectively [and wherein]; and

a control unit that uses the Raman pump to provide modulated Raman pump light to the span of transmission

fiber and that uses the optical monitor to measure  
corresponding backscattered Raman pump light from the span of  
transmission fiber.

17. (Amended) [The optical amplifier equipment defined in claim 13] Optical amplifier equipment for amplifying optical data signals in a fiber-optic communications link that has at least one span of transmission fiber for carrying the optical data signals, comprising:

a Raman pump for producing Raman pump light to create Raman gain for the optical data signals in the span of transmission fiber, wherein the Raman pump light and the optical data signals propagate in opposite directions in the span of transmission fiber, and wherein the Raman pump produces pump light at a first wavelength and a second wavelength [and wherein the optical monitor comprises];

first and second optical monitors for measuring the backscattered Raman pump light from the span of transmission fiber at the first and second wavelengths, respectively; and

a control unit that uses the Raman pump to provide modulated Raman pump light to the span of transmission

fiber and that uses the optical monitors to measure  
corresponding backscattered Raman pump light from the span of  
transmission fiber, wherein the control unit modulates the  
first wavelength to produce a series of pulses that are each 1-  
500 ns in duration and that have a frequency of less than 5  
kHz.